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AMSAT NEWS SERVICE
ANS-340

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:

ans-editor@amsat.org

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SB SAT @ AMSAT $ANS-340.01
Magnetic Flip Experiment Aboard AO-51 Successfull

AMSAT News Service Bulletin 340.01
  From AMSAT HQ SILVER SPRING, MD.
December 6, 2009
To All RADIO AMATEURS
BID: $ANS-340.01

Since its launch AMSAT-Echo AO-51 has carried a spacecraft attitude adjustment experiment which was tested for the first time this week. The experiment contains a "reversible" magnet which will align the spacecraft with Earth's magnetic field.

On the December 2, 2242 UTC pass of AO-51 AMSAT-NA VP Operations Drew Glasbrenner, KO4MA issued the command to reverse the magnet and "flip" the orientation of the satellite. The first effect of the experiment was expected to be some changes in signal levels and patterns. AO-51's 435 MHz downlink was expected to become slightly weaker in the northern hemisphere and slightly stronger in the southern hemisphere.

ZL2BX reported, "With two usable passes over ZL last night the most notable feature was the frequent polarity shifts. Certainly good strong signals but difficult to tell how it compares to previous signal levels."

IW4DVZ reported results from a contact with EI8JB, "For me nothing changed, I received from AO-51 the same strong signal as usual."

W6ZKH reported the only difference were frequent polarity changes. The signal strength here on the West Coast seemed to be the same as before.

Tom Clark, K3IO offered an explanation for the received signal changes, "Since angular momentum must be conserved when you "flip" the spacecraft it should precess (probably looking like tumbling) until the momentum dampers absorb the change. Keep an eye on the solar panel currents and I'll bet the spin rate will change."

Drew concluded, "We are still sifting through the telemetry, but as Tom suggested in his email, the satellite is precessing (wobbling) quite severely. This will calm down as the hysteresis rods do their job. Initial reports from Australia and New Zealand indicate stronger signals, and about the same from South Africa. There are some peculiar things about the magnetic field near South Africa, so that doesn't surprise me too much, but is worth digging into once we get the whole orbit telemetry down."

The AO-51 Command Team appreciates any signal reports or observations for the next few days that you can email to ao51-modes@amsat.org or ko4ma@amsat.org. In a week or so the Command Team expects to re-orient AO-51 back to its original attitude.

Twitter users can receive tweets from the AO-51 command team at http://twitter.com/AMSAT or by adding "AMSAT" to your follow list.

[ANS thanks the AO-51 Command Team for the above information]

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SB SAT @ AMSAT $ANS-340.02
OSCAR-11 REPORT 30 November 2009

AMSAT News Service Bulletin 340.02
  From AMSAT HQ SILVER SPRING, MD.
December 6, 2009
To All RADIO AMATEURS
BID: $ANS-340.02

This report covers the period from 21 April 2008 to 30 November 2009.

The satellite unexpectedly resumed transmissions recently. It was first heard by Keith N4ZQ on 19 November 2009 and transmissions continued until it switched OFF on 27 November. It was last heard by Tetsu JA0CAW at 23:59 UTC 26 November 2009. Previously, it was last heard by Peter ZL3TC on 23 April 2008, on a single pass.

Study of the satellite's behavior had suggested that its battery would not sustain operation during solar eclipses, and the watchdog timer would switch the satellite OFF after less than an orbit. Eclipses are now occur during every orbit and will continue for many years. In practice this meant that OSCAR-11 would only be heard occasionally by stations monitoring the frequency while listening for other satellites.

During this period of inactivity the satellite achieved 25 years in orbit on 01 March 2009. Congratulations to Professor Sir Martin Sweeting, his team at the University of Surrey and participating amateur radio groups, for this fine achievement.

Good signals have been received by stations located all over the world during this recent period of activity and telemetry has been decoded successfully. However, the satellite has only transmitted when in sunlight. I have been overwhelmed by the number of reports received, too many to list individually! Many thanks to everyone who sent email reports or posted to AMSAT-BB.

The telemetry is unchanged from the 2008 downloads. The on-board clock is now 241 days slow. When last received in 2008 it was 83 days slow. The increasing error suggests that the clock may be stopping, when the satellite is in eclipse.

The exact date when the satellite started transmitting is not known,

so if the watchdog timer was reset, the next transmissions might start around 16 December, however if the timer went through its full operating cycle, transmissions could resume around 06 December.

The Beacon frequencies are -

VHF 145.826 MHz. AFSK FM ASCII Telemetry

UHF 435.025 MHz. OFF

S-band 2401.5 MHz. OFF

The satellite is now subject to eclipses during every orbit. Long term predictions indicate that eclipses will occur until 2019, when there will be some eclipse free periods until 2023. However these very long term predictions should be regarded with caution, as large tracking errors can accumulate over long periods of time.

When telemetry was last received it showed that one of the solar arrays had failed, and there was a large unexplained current drain on the main 14 volt bus. After 25 years in orbit the battery has undergone over 100,000 partial charge/discharge cycles, and observations suggest that it cannot power the satellite during eclipses lasting more than about ten minutes, or sometimes even during periods of poor solar attitude.

RECEPTION REPORTS REQUESTED!

Please send reception reports to xxxxx@amsat.org (replace xxxxx by g3cwv) or post to amsat-bb. If you have a file, please let me know what you have, before sending it!

The satellite transmits on 145.826 MHz., set receiver to NBFM. OSCAR-11 has a characteristic sound, rather like raspy slow morse code, sending "di di dah dah dah dah dah dah dah" sent over five seconds. If you are receiving a very weak signal, switch the receiver to CW or SSB. You should hear several sidebands around the carrier frequency, should be able to hear the characteristic 'morse code like' sound on at least one sideband.

Please note that you need a clean noise free signal to decode the signals. There is an audio clip on my OLD website www.users.zetnet.co.uk/clivew/ which may be useful for identification and as test signal for decoding.

The current status of the satellite, is that all the analogue telemetry channels, 0 to 59 are zero, ie they have failed. The status channels 60 to 67 are still working. The real time clock is showing a large accumulated error, although over short periods timekeeping is accurate to a few seconds per month. When last heard the clock was 241 days slow. The day of the month has a bit stuck at 'one' so the day of the month may show an error of +40 days for some dates. The time display has switched

into 12 hour mode. Unfortunately, there is no AM/PM indicator, since the

time display format was designed for 24 hour mode.

The spacecraft computer and active attitude control system have switched OFF, ie. the satellite' attitude is controlled only by the passive gravity boom gradient, and the satellite is free to spin at any speed.

The watchdog timer now operates on a 20 day cycle. The ON/OFF times have tended to be very consistent. The average of many observations show this

to be 20.7 days, ie. 10.3 days ON followed by 10.4 days OFF. However, poor solar attitude may result may result in a low 14 volt line supply, which may cause the beacon to switch OFF prematurely, and reset the watchdog timer cycle. When this occurs, the beacon is OFF for 20.7 days.

OSCAR-11 was the second satellite from the University of Surrey, http://www.ee.surrey.ac.uk/SSC. It was designed, built and launched, within a time scale of six months, by a team headed by Martin Sweeting G3YJO. Amateur radio groups working at various locations in the world, also contributed to the project. It used commercially available 'off the shelf' components (COTS). Following the success of these satellites,

in 1985 Surrey Satellite Technology Ltd. www.sstl.co.uk was formed, as a commercial venture. This grew into a major company which has produced over 30 small satellite projects for a global market.

The University of Surrey has recently sold it's major shareholding in SSTL to EADS-Astrium. The joint company will therefore have the experience of manufacturing large and small satellites, for geo-synchronous and low earth orbits.

In regognition of his work, Martin G3YJO, was appointed Professor at the University of Surrey. He received an OBE in the 1995 Queens birthday honours list, and in 2002 a knighthood in the New Year's honours list.

Listeners to OSCAR-11 may be interested in visiting my websites. If you need to know what OSCAR-11 should sound like, there is a short audio clip for you to hear. The last telemetry received from the satellite is available for download. The website contains an archive of news & telemetry data which has now been updated. It also contains details about using a soundcard or hardware demodulators for data capture. There is software for capturing data, and decoding ASCII telemetry. The URL is http://www.users.zetnet.co.uk/clivew/ However, please note that this site is no longer being updated, and the latest news and information will and will be uploaded to my new site which is currently being constructed at http://www.g3cwv.co.uk.

If you place this bulletin on a terrestrial packet network, please use the bulletin identifier $BID:U2RPT145.CWV, to prevent duplication.

73 Clive G3CWV xxxxx@amsat.org (please replace xxxxx by g3cwv)

[ANS thanks Clive, G3CWV, for the above information]

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SB SAT @ AMSAT $ANS-340.03
ARISS Status - 30 November 2009

AMSAT News Service Bulletin 340.03
From AMSAT HQ SILVER SPRING, MD.
December 6, 2009
To All RADIO AMATEURS
BID: $ANS-340.03

1. De Winne Speaks with Dumbleyung Primary School through ARISS

On Thursday, November 26, Dumbleyung Primary School in Western Australia took part in an Amateur Radio on the International Space

Station (ARISS) contact with Frank De Winne, ON1DWN via telebridge station VK4KHZ in Australia. To prepare for the contact, students studied Earth, its structure and the solar system. As part of the ARISS event, students in Years 5 -7 gave presentations of their space work and viewed footage of the ISS as well as video of an astronaut interview. All 21 children had their questions answered during their radio contact and ABC (Australian Broadcasting Corporation) News covered the event.

2. Don Bosco Institut Experiences ARISS Contact

On Thursday, November 26, an Amateur Radio on the International Space Station (ARISS) contact was held between Institut Don Bosco in Bruxelles,
Belgium and Frank De Winne on the ISS. The connection was made possible through telebridge station ON4ISS in Belgium. Students asked 19 questions
of the astronaut during the ISS pass. Don Bosco is a secondary industrial
technical school with an enrollment of approximately 750 students and offers courses in carpentry, electricity, mechanics, computing, printing

and electronics.

3. ARISS Contact held with Katholieke Centrumscholen Sint-Truiden Students

Students attending Katholieke Centrumscholen Sint-Truiden in Sint-Truiden,
Belgium experienced a successful Amateur Radio on the International Space
Station (ARISS) contact with Frank De Winne on Thursday, November 26 via telebridge station ON4ISS in Belgium. Twenty questions were asked and answered. In order to prepare for the radio contact, the students studied
astronomy and science. In addition, the school headmaster talked to the youth about the ISS and his own experiences during two "space camps" in the U.S. (Huntsville and Kennedy Space Center).

4. ARRL Covers Installation of Columbus Module Antennas

The American Radio Relay League (ARRL) ran an article about the new antennas that were installed on the Columbus module. To view the story, which ran in the November 25 issue of the ARRL Letter, see:
https://www.arrl.org/arrlletter/index.html?issue 09-11-25

5. ARISS News on Amateur Radio Newsline

On November 27, Amateur Radio Newsline Report 1685 reported on the new Columbus module ARISS (Amateur Radio on the International Space Station)
antenna. To view "Ham Radio in Space: ISS Gets New Dual Band Antenna,"
see: ftp://ftp.arnewsline.org/quincy/News/news.txt

6. New Web Site for ARISS-Brazil

ARISS Brazil recently formed a partnership with the internet portal Dii¿½rio da Produi¿½i¿½o.com to publicize ARISS activities in Brazil and

South America. To view the Web site, go to: http://diariodaproducao.com/

[ANS thanks Carol, KB3LKI, for the above information]

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In addition to regular membership, AMSAT offers membership in the
President's Club. Members of the President's Club, as sustaining donors
to AMSAT Project Funds, will be eligible to receive additional benefits.

Application forms are available from the AMSAT Office.

73,
This week's ANS Editor,
Lee McLamb, KU4OS